CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
Sarah M. Penicks

Project Number
S0109

Project Title
Flight of Discovery

Abstract

Objectives/Goals
I believe that the rocket that I have built will fly 350 # 1500 feet into the atmosphere with a type G engine.

Methods/Materials
Estes rocket g-force kit ; Recovery system (Parachute and Shroud lines); Launch lug; Recovery wadding; Fins; Engine mount; Nose cone; Body tube; Igniter & Plug; Ezacto hobby knife kit; 12 hour 2 set epoxy glue; Pad of steel wool; Sheet of fine sandpaper; Type #G# engine ; Rocket Launch pad kit; Roll of scotch tape; Pencil.

Results
I assembled and launched the rocket and my hypothesis was correct. However, my rocket blew up upon impact because the motor casing caught fire in mid-flight and burned through to the shock cord and parachute shroud and all the way through the body tube thereby destroying the rocket. However, the flight was a success in that it reached its estimated altitude. Had the recovery system worked properly, it would have been a good flight. Therefore, after building and launching the rocket, I must conclude that the experiment was a success although the rocket was lost. I learned volumes about the dynamics of an object in flight. I now understand what the four forces that act upon an aircraft in flight are. I learned that aircraft must have a center of gravity in order to remain straight and level during flight. I learned how to reduce the drag on my rocket so it would accelerate faster. Overall, the project was a success.

Conclusions/Discussion
The intense heat of the launch burned a hole through both the cardboard engine casing and the body tube of the rocket causing it to lose the aerodynamic quality that is necessary for controlled flight. The rocket did successfully reach the estimated apogee that was supposed in the hypothesis for the experiment of the rocket. However, the recovery system failed to deploy at the returning of the rocket to the landing. Therefore, rocket was damaged on the fins, body tube, and nose cone, which destroyed the rocket completely. In repeating this rocket experiment, I would check the recovery system more carefully to ensure a better flight and, as well as achieving a successful landing, use the recovery system so it would not damage the rocket and bring the rocket down to a successful landing.

Summary Statement
My project is about the flight of a model rocket.

Help Received
1st Lt. John Binder, C/Capt. Brysen Davis, Shannon Penicks